

## New: Protective Coating AR-PC 5094.02

**Conductive protective coating for polymer and novolac-based resists**  
Top layer for the dissipation of e-beam charges on insulating substrates

E-Beam Resists

### Characterisation

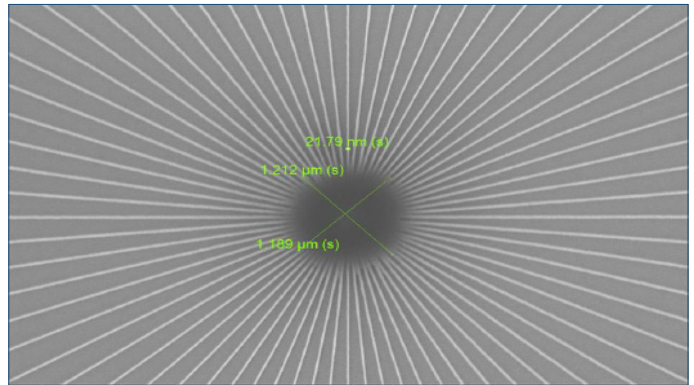
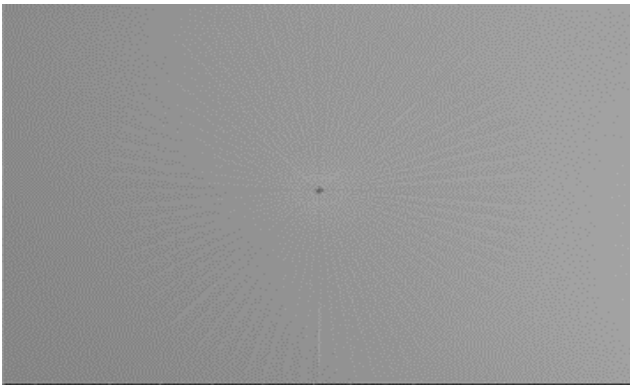
- as protective coating, this resist is not sensitive to light / radiation
- thin, conductive layers for the dissipation of charges during electron exposure
- for coating on all AR e-beam resists, e.g. CSAR 62, Medusa 84 SiH, except CAR resists
- Improved properties compared to AR-PC 5092.02
- easy removal with water after exposure
- polyaniline-derivative dissolved in water

### Properties I

Parameter / AR-PC	5094.02
Solids content (%)	2
Viscosity 25°C (mPas)	1
Film thickness/4000 rpm (nm)	42
Film thickness/1000 rpm (nm)	100
Resolution (µm) / Contrast	-
Storage temperature (°C)*	8-12

\* Products have a guaranteed shelf life of 6 months from the date of sale if stored correctly and can also be used without guarantee until the date

### Properties II



Siemens star written on quartz with the new conductive coating Electra 92 (AR-PC 5094.02) spun on to prevent charge build-up. This variant of Electra 92, specially developed for Medusa 84 SiH, has excellent coating and adhesion properties.  
B. Drent, AMOLF NanoLab Amsterdam

### Conductivity

Conductivity in layer, 60 nm (S/m)	1.2
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### Process parameters

Substrate	4" wafer quartz with AR-P 662.04
Coating	2000 rpm, 60 nm
Soft bake	85 °C

### Process chemicals

Adhesion promoter	-
Developer	-
Thinner	-
Remover	DI-water



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### Process conditions

This diagram shows exemplary process steps for resist Electra 92 - AR-PC 5094.02 and PMMA-resist AR-P 662.04. All specifications are guideline values which have to be adapted to own specific conditions.

1. Coating		AR-P 662.04 on insulating substrates (quartz, glass, GaAs) 4000 rpm, 60 s, 140 nm
1. Soft bake ( $\pm 1\text{ }^\circ\text{C}$ )		150 °C, 2 min hot plate or 150 °C, 30 min convection oven
2. Coating		AR-PC 5094.02 2000 rpm, 60 s, 60 nm
2. Tempering ( $\pm 1\text{ }^\circ\text{C}$ )		90 °C, 2 min hot plate or 85 °C, 25 min convection oven
E-beam exposure		ZBA 21, 20 kV Exposure dose ( $E_0$ ): 110 $\mu\text{C}/\text{cm}^2$ (AR-P 662.04, 140 nm)
Removal		AR-PC 5094.02 DI-water, 60 s
Development (21-23 °C $\pm 0.5\text{ }^\circ\text{C}$ ) puddle		AR-P 662.04 AR 600-56, 2 min AR 600-60, 30 s
Stop		
Post-bake (optional)		130 °C, 1 min hot plate or 130 °C, 25 min convection oven for slightly enhanced plasma etching stability
Customer-specific technologies		Generation of e.g. semi-conductor properties, etching, sputtering
Removal		AR 600-71 or O <sub>2</sub> plasma ashing

### Processing instructions

The conductivity may be varied by adjusting the thickness with different rotational speeds. Thicker layers of 90 nm thus have a 2.5 times higher conductivity as compared to 60 nm thick layers.

For the build-up of an even conductive layer, the substrate should be wetted with the resist solution before the spin process is started.